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DIVISION OF
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OIL, GAS & MINING

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December 16, 1988

DOGM
MINERALS PROGRAM
FILE COPY

Mr. Glenn M. Eurick
Barrick Mercur Gold Mines, Inc.
P.O. Box 838
Tooele, Utah 84074

Re: Dump leach No. 2 leakage

Dear Mr. Eurick:

We have evaluated your letter of 19 August 1988 concerning the increased leakage flow rate of dump leach No. 2 and have the following concerns:

- a. Based on flow rates from Barrick Mercur's leakage collection system-data log, the leakage flow rate has increased by over 4 times for readings after March 1988 as compared with the 16 months of data prior to March 1988, see attachment No. 1.
- b. Your letter states that increases in leakage flow rates are a direct result of increases in leaching solution flow rates. Based on information presented in table 1 of your letter, it appears that leaching rates have increased by 2 times while as already stated leakage flow rates have increased by over 4 times.
- c. The allowable leakage flow rates per acre of pad for western states which allow leakage detection/collection systems is about 500 gallons per acre day. Assuming approximately 20 acres of dump leach #2 liner surface this value has increased from 324 gallons per acre day to 1397 gallons per acre day, since March 1988. Systems in Utah are designed for leakage detection only.

- d. Your letter states, "pregnant solution pool depths within dump leach #2 are minimized as maximum flow rates in and out of the dump leach are sought to achieve ultimate gold recovery." Pregnant solutions should not be allowed to accumulate on the flexible membrane by design and additionally because of the lack of knowledge about the location of the hole in the flexible membrane. The hole may be located within the influence of the pregnant solutions ponding on the liner and result in a hydraulic head on the clay which can cause leakage to penetrate the clay liner.
- e. Based on our interpretation of notes from Barrick Mercur's leakage collection system-data log, it appears that the leakage detection drainage system was frozen from 15 January 1988 to 1 March 1988, approximately 46 days.

At the leakage flow rate prior to March 1988 (4.26 gallons per minute) this would result in the impoundment of 282,182 gallons or 3.77 feet maximum of leakage over a 100-foot square grid. At the average leakage flow rate after March 1988 (19.77 gallons per minute) this would result in the impoundment of 1,309,565 gallons or 17.5 feet maximum of leakage over a 100-foot square grid. These increased hydraulic head greatly reduce the ability of the clay liner to provide ground water protection.

Based on these concerns, we request that requirement #4 for 40 MIL ^{H (?)}LDPE liner, as stated in the spill/leak contingency plan for dump leach #2 (copy attached), be utilized to estimate the current status of leakage penetrating into the clay liner. This evaluation should take into account or address the following:

- a. Maximum and average effective pool depth of leakage which has collected on the secondary clay liner over the life of the project.
- b. Maximum and average surface area of clay liner in contact with these leakage pools.
- c. Time duration of various depths of leakage pools.
- d. Additional information which can document the performance of the secondary clay liner.
- e. Maximum gravity flow rate for the leak detection drain line which will not cause ponding on the surface of the clay liner.
- f. New estimated operating life for dump leach #2.

Mr. Glenn M. Eurick
page three

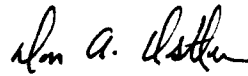
We request that the conclusions of the evaluation of requirement #4 of the spill/leak contingency plan be submitted to the Bureau within 30 days of receipt of this letter. It is important that this matter be evaluated as quickly as possible.

Our concerns about this situation are great because as you know, there is no means to determine the performance or establish the current leakage condition of the clay liner.

Please call Charlie Dietz of my staff if there are any questions.

Sincerely,

Utah Water Pollution Control Committee



Don A. Ostler, P.E.
Executive Secretary

cc: Tooele County Health Department w/encl.

CGD/ag:dgm

4076y-35

Attachment No. 1

Month	Avg. leakage flow rate gallons per minute
August 1986	2.59
September 1986	4.53
October 1986	4.76
November 1986	4.13
December 1986	4.1
January 1987	5.3
February 1987	1.8
March 1987	8.5
April 1987	3.2
May 1987	4.8
June 1987	1.8
July 1987	6.1
August 1987	8.3
September 1987	3.8
October 1987	3.1
November 1987	1.4
December 1987	*
January 1988	*
February 1988	*
March 1988	20.0
April 1988	17.0
May 1988	23.5
June 1988	20.8
July 1988	13.7
August 1988	19.6
September 1988	25.7
October 1988	19.0
November 1988	18.6

* No date available

BARRICK MERCUR GOLD MINES, INC.

September 11, 1985

Mr. Calvin K. Sudweeks, Executive Secretary
Utah Water Pollution Control Committee
Utah Department of Health
3180 State Office Building
P.O. Box 45500
Salt Lake City, Utah 84145-0500

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SEP 11 1985

**BUREAU OF WATER
POLLUTION CONTROL**

Dear Mr. Sudweeks:

Subject: Dump Leach Areas 1 and 2, Leak Contingency Plans

Barrick submitted on August 29, 1985 a leak contingency plan for our dump leach area. At the request of your Charles Dietz, paragraph 5, page 2, of the August 29, 1985 correspondence has been modified to reflect more specific procedures. The modified plan is attached for your review.

Also submitted are two prints of Drawing 100-13-016. The prints previously submitted on August 30, 1985 were illegible. Two copies of Technical Specifications DL-1 and DL-2 are enclosed per the request of Mr. Dietz.

Please contact me should you have any questions.

Respectfully,



Glenn M. Eurick
Environmental & Occupational Health Coordinator

GME/cg

Enclosures

cc: J. C. Sprague
J. T. McDonough
R. E. Brewer

File
Industrial w.l
Barrick Mercur

BARRICK MERCUR GOLD MINES, INC.

DUMP LEACH AREAS 1 & 2 SPILL/LEAK CONTINGENCY PLAN

Modified September 10, 1985
G. M. Eurick

The following actions will be taken in the unlikely event of line or liner failure:

Solution Lines

1. Upon detection of pipe leak, rupture, or other type of failure, all pumping of solution through the failed line(s) will cease immediately.
2. Repairs to, or replacement of, the failed line(s) section will be completed as soon as possible.
3. Verbal notification of the line failure will be reported to the Bureau within 24 hours of detection, with a written description of the incident submitted within 7 days of the detection.
4. As all pipeways are sloped to drain towards the dump leach, solution containment will pose no problem. Any standing solution in low spots will be treated with hypochlorite to destroy the cyanide. Repairs to the clay-lined ditch will be made where required to maintain ditch integrity.

40 Mil LLDPE Liner

1. The leak detection system will be monitored daily.
2. If solution flow is discovered, a sample will be analyzed for cyanide content to verify source. A flow rate will be determined.
3. Upon verification of liner failure, the Bureau will be notified verbally within 24 hours and in writing within 7 days.
4. Permeability and clay geochemistry data obtained during the construction of the two 9" compacted clay lifts, which serves as the primary liner for groundwater impact mitigation,

will be applied to the solution flow rate and cyanide content data. This data will be used to calculate the time period before cyanide solution could conceivably permeate the clay liner and enter the foundation material. The Bureau will be presented with this information for review and approval of the time period determined before operations must cease over that liner.

5. Upon depletion of the determined operating period, all leaching will cease. The dumps will be flushed with fresh water. Monitoring of the leak detection system as well as the pregnant solution pumping system will continue until both solutions are less than 5 ppm free cyanide. Pumping/drainage will continue on an intermittent, long-term basis until the dump is dewatered to the point that no pumpable recharge occurs. Solution samples will be analyzed periodically for total water chemistry, including metals, as well as cyanide content.
6. Dependent upon a variety of issues, including existing configuration of the dump, costs, construction schedules, etc., the decision to place new liner and more lifts over the flushed dump will be made at that time. The alternative of a new site may be more practical.
7. Ultimate abandonment procedures are as stated in 4.b., page 1, of your August 9, 1985 letter.

Barrick feels the contingency plans presented above are fair and reasonable in light of the considerable environmental impact mitigation design measures utilized. Please contact me at your convenience should you have any questions.